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Executive Summary

Widespread sharing of research and scholarship is fundamental for addressing many of today's most important problems. Research libraries have been at the forefront of promoting open scholarship for many years. They play a pivotal role in the creation, management, discovery, and use of scholarship and have been expanding their financial contributions towards open scholarship over time. However, to date, their investments in "open" have not been well-documented, nor have they always been widely recognized by the broader community. In 2019, the Canadian Association of Research Libraries (CARL) undertook a comprehensive survey of CARL member libraries' investments in open scholarship in order to have a better understanding of what is being spent by Canadian academic libraries on open services, platforms, content, and infrastructures. The survey found that the total, aggregate spending on open for all 28 responding libraries was \$23 million CAD, with an average spend per institution of \$827,086 CAD. This represents an average of 3.09% of the total library budget spent on open, ranging from 0.88% to 7.23% across respondent libraries.

By far, the largest category of investment is in local staff, with an average of 74% of the libraries' open investments going toward salaries. On average, respondent libraries have about 7 FTEs working in open activities, scattered across a number of areas: digitized content, scholarly communications, open repositories, and research data management (including staff contributing to the national [Portage](#) project). The second largest category of spending on open were funds directed to publishers through several means: consortial licences via the Canadian Research Knowledge Network (CRKN) or, in Ontario, the regional association Ontario Council of University Libraries (OCUL) via Scholars Portal, institutional membership with open access publishers, and payment of article processing charges (APCs). This amounted to an average of 14% of total open spending, or approximately \$3.2 million CAD in total, 80% of which was directed toward licences with open access publishers or platforms. The rest of the open investments, approximately 12%, were spent on a wide variety of other types of open services, platforms and infrastructures.

Introduction

Widespread sharing of research and scholarship is fundamental for addressing many of today's most important problems. Making research outputs such as articles, preprints, data, and other resources openly available increases the impact of our collective investments in research, allowing them to be read, used, and repurposed, not only in academia, but also by other communities, such as policy makers, industry, practitioners and the general public; communities that would not normally have

access to this content.¹ Open scholarship (also often known as “Open Science”) is an umbrella term that refers to “various movements aiming to remove the barriers for sharing any kind of output, resources, methods or tools, at any stage of the research process. Open access to publications, open research data, open source software, open collaboration, open peer review, open notebooks, open educational resources, open monographs, citizen science, or research crowdfunding, fall into the boundaries of Open Science.”²

Research libraries have been at the forefront of promoting open scholarship for many years. They play a pivotal role in the creation, management, discovery, and use of scholarship and have been expanding their financial contributions toward open scholarship over time. However, to date, their investments in “open” have not been well-documented, nor have they always been widely recognized by the broader community.

The Canadian Association of Research Libraries (CARL), whose membership includes the 29 largest Canadian university libraries as well as Library and Archives Canada and the National Research Council’s National Science Library, has been advocating for openness for close to two decades. In 2017, CARL published a roadmap guided by a vision of an “open, sustainable, effective and innovative scholarly communication system that is governed and managed by the scholarly community, and that reflects a substantial role for Canadian academic libraries”³.

As part of these ongoing efforts to increase access to research outputs, and to have a better understanding of the current landscape, in 2019, CARL undertook a survey of CARL academic libraries’ investments in open. This report provides a summary and analysis of the aggregate data from the survey and discusses some outcomes and next steps.

Context

In August 2017, a paper entitled “The 2.5% Commitment” was distributed across the North American library community. The paper proposed that every academic library should commit to invest 2.5% of its total budget to support the common

¹ Piwowar H, Priem J, Larivière V, Alperin JP, Matthias L, Norlander B, Farley A, West J, Haustein S. 2018. The state of OA: a large-scale analysis of the prevalence and impact of Open Access articles. PeerJ 6:e4375 <https://doi.org/10.7717/peerj.4375>

² <https://www.fosteropenscience.eu/node/1420>

³ http://www.carl-abrc.ca/wp-content/uploads/2017/03/CARL_ScholComm_Roadmap_EN.pdf

infrastructure needed to create the open scholarly commons.⁴ This paper generated interest and debate, and was widely discussed in the Canadian context, including the potential benefits of identifying benchmarks. However, to advance this discussion, we must first have an understanding of the current spending on open resources by research libraries in Canada. To that end, in the summer/fall of 2019, CARL undertook a comprehensive survey of its members in order to gain a better understanding of Canadian research libraries' investments in open.

Objectives

CARL had several motivations for undertaking this survey:

- To gain a better understanding of how much is being spent by Canadian; academic libraries on open services, platforms, content, and infrastructures
- To help map the “open” landscape and identify gaps in current investments;
- To support Canadian libraries in shifting funds toward open by defining appropriate benchmarks.

Scope and Methodology

The intent was to be as comprehensive as possible in terms of the investments documented through the survey. The survey collected data about all types of investments in open, which include local services related to managing open content (articles, data, monographs and other resources), as well as support for externally hosted platforms, open software projects, advocacy organizations, article processing charges and open access memberships, and other tools. The costs of preservation and underlying infrastructure for these open services were excluded from the survey. While preservation activities are part of the management of open content, it was deemed to be too difficult to determine the portion of those services that were devoted to open resources.⁵ Additionally, for other types of infrastructure (cloud services, servers, etc) there are significant differences in how this is funded across academic institutions, making comparisons unsuitable.

The survey looked at data from fiscal year 2018-19, or where payments were related to the calendar year, figures from 2019 were used. An initial survey was distributed to

⁴ David W. Lewis, Lori Goetsch, Diane Graves, and Mike Roy. Funding community controlled open infrastructure for scholarly communication The 2.5% commitment initiative. *College and Research Libraries News*, Vol 79, No 3 (2018). <https://crln.acrl.org/index.php/crlnews/article/view/16902/18557>

⁵ For more information about preservation activities at Canadian libraries, see this 2019 CARL report: <https://www.carl-abrc.ca/news/final-report-of-digital-preservation-capacity-study/>

all 29 CARL academic libraries in April 2019 and, based on feedback, the questionnaire was further refined and redistributed again in August 2019. The survey was open until the end of September and individual responses were validated in October 2019 with direct follow-up questions to respondents to ensure all questions were interpreted correctly, no investments were missing, and investments were counted only once.

Summary Results

Total Investments in Open

28 of the 29 academic member libraries in CARL responded to the survey. The total, aggregate spending on open for all 28 responding libraries was \$23 million CAD, with an average spend per institution of \$827,086 CAD (the lowest investment was \$115,000 and the highest investment was \$3.2 million). This represents an average of 3.09% of the total library budget spent on open, ranging from 0.88% to 7.23% across respondent libraries. Given there are a wide range of budgets across the 28 participating libraries, the responses were divided into 4 groups (based on existing Canadian Research Knowledge Network banding⁶): Group 1 represents institutions with smallest budgets, and Group 4 represents institutions with the largest budgets. In terms of total spending on open, the largest libraries had the largest investments, but the group with the smallest budgets tended to punch above their weight and invest a higher portion of their budgets in open.

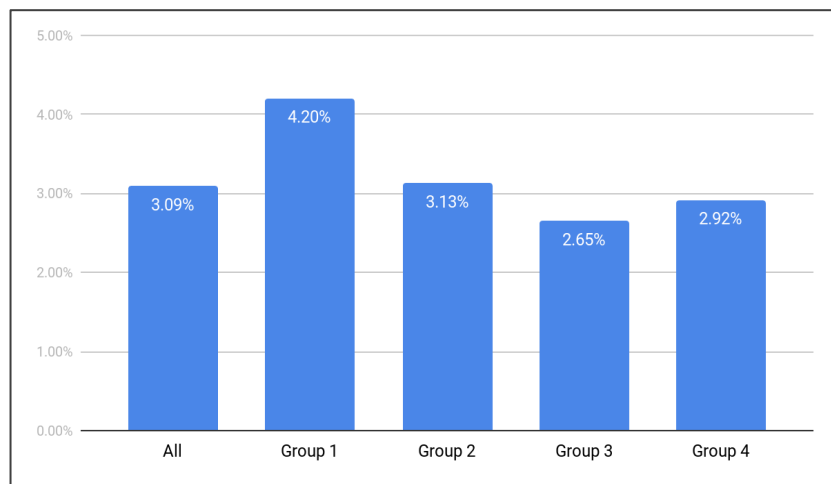


Figure 1: Average portion of budget invested in open

⁶ <https://www.crkn-rcdr.ca/en/banding-system>

Category of Investment	Portion
Salaries (portion related to open activities)	74.11%
APCs / OA publisher memberships, licences (external)	14.33%
OA journal & monograph publishing (including university press contributions; no staff expenses)	3.04%
Advocacy, lobbying, education, training	2.87%
Openly available digitized content	2.19%
Open research data platforms	1.88%
Open repositories (articles, monographs, theses & dissertations; no staff expenses)	0.68%
Open educational resources (OER)	0.55%
Other tools	0.37%

Table 1: Distribution of open investments

Library Staff

As illustrated in Table 1, the largest category of investment by far is in local staff, with an average of 74% of the libraries’ open investments going toward salaries. On average, respondent libraries have about 7 FTEs working in open activities, scattered across in a number of areas: digitized content, scholarly communications, open repositories, and research data management (including staff contributing to the national [Portage](#) project). Taken together, the total annual staff time devoted to open activities in all 28 libraries is 194.08 FTE, representing spending of about \$17 million CAD.⁷

It should be noted that this was a challenging figure for many respondent libraries to determine because many staff have several different responsibilities, some related to open, and some not. For example, technology staff may manage both open infrastructures and services while also supporting subscription-based or institution-only services. The average FTEs for each staffing category should be considered a best estimate, since many library positions contribute time to several different topical areas.

⁷ The figures in this category include both salaries and benefits of staff.

Staff responsibilities	Average FTE
Openly available digitized content	1.40 FTE
Advocacy, promotion, and scholarly communication	1.30 FTE
Open repositories (articles, monographs, theses & dissertations; no staff expenses)	1.05 FTE
Open research data	0.86 FTE
OA journal & monograph publishing (including university press contributions; no staff expenses)	0.69 FTE
Technical infrastructure	0.57 FTE
Open educational resources	0.29 FTE
APCs / OA publisher memberships, licences	0.18 FTE
Other	0.16 FTE
Average total FTEs	6.91 FTE

Table 2: Distribution of staff working in open services and activities

OA Memberships, Licences and APCs

The second largest category of spending on open were funds directed to publishers through several means: consortial licences via the Canadian Research Knowledge Network (CRKN) or, in Ontario, the Ontario Council of University Libraries (OCUL) via Scholars Portal, institutional membership with open access publishers, and payment of article processing charges (APCs). This amounted to an average of 14% of total open spending, or approximately \$3.2 million CAD in total, 80% of which was directed toward licences with open access publishers or platforms.

- The majority of the \$2.6 million in licences went toward Canadian open access content providers through Canadiana (Canadiana Heritage Content Access & Preservation Fund 2019 - just over \$1.5 million) and Coalition Publica (just over \$500,000).
- Eight libraries paid APCs for the fiscal year 2018-2019, ranging from \$12,418 to \$120,000 per institution, for a total of \$1.16 million. The other 20 libraries paid no funds toward APCs.
- Approximately \$300,000 went to funding the SCOAP3 project (Sponsoring Consortium for Open Access Publishing in Particle Physics).

The rest of the funds were spread across several other publishing initiatives (Open Library of Humanities, Knowledge Unlatched, MDPI, Hindawi, F1000, PeerJ, Bionline,

Philosophical Papers, and Biomed Central).

Other External Services and Tools

The remaining 12% of investments in open were spent on a wide variety of other types of open services, platforms and infrastructures:

- Digitization activities or management of digitized content (HathiTrust, Internet Archive, ContentDM);
- Memberships in advocacy organizations (a portion of the CARL membership fees, SPARC, Confederation of Open Access Repositories - COAR, and a few others);
- Journal hosting services (most funds in this category went to OCUL's Scholars Portal for hosting OJS, although a few organizations used journal hosting services provided by Ubiquity Press and Bepress);
- Funding for external repositories (mainly arXiv) and repository development support or hosting services;
- Financial sponsorship of organizations that manage open source software platforms (most often Public Knowledge Project and DuraSpace);
- Funding for development of open educational resources (OER) on campus;
- A relatively small amount of funding was provided to other tools (Directory of Open Access Journals, 1Findr).

Discussion

The survey results provide some interesting insights into how Canadian research libraries are currently supporting open scholarship. While investments in open content, services, and infrastructures still represents a relatively small portion of total library budgets (3.09% on average, as compared to, for example, an average of 44% of budgets spent on materials expenditures, representing a total of \$337 million for the same 28 libraries⁸), the aggregate amount of \$23 million CAD per year is still significant and has an impact on the scholarly communications landscape. There is quite a large variability across organizations both in terms of total amount spent on open, which ranges from \$115,000 to \$3.2 million, and portion of total budget, which ranges from 0.88% to 7.23%. This likely reflects different institutional priorities and contexts, as well as a disparity in the availability of resources for open content and services across institutions. Clearly there is not currently a common practice or standard related to these types of investments.

⁸ As reported in the CARL Statistics 2017-2018 (page 6): https://www.carl-abrc.ca/wp-content/uploads/2019/12/CARL-ABRC_Stats_Pub_2017-18.pdf

The vast majority of funding on open (74%) is going toward local staff for managing institutional operations such as scholarly communications librarians, managing repositories and open access journals, or research data management. Human capital is the most important asset that libraries have and staffing in this area reflects a growing strategic priority for libraries related to open. Libraries may also have more flexibility in terms of redirecting budgets toward open in the area of staff as opposed to external services. One of the challenges with supporting open content and services is that it can be more challenging to rationalize investments because many open services do not use a direct pay-for-service model (with the exception of those that use APCs).

Open services, publishers, and platforms are financially vulnerable due to a number of factors, including being dependent on time-limited project funding, and the need to compete for funds with large commercial publishers. In terms of funding external content providers, Canadian initiatives seem to be a priority, with Canadiana and Coalition Publica representing the majority of funds going toward open content. \$2 million of the \$2.6 million invested in open content goes to those two platforms. Both of these initiatives are funded through national licences with CRKN, which also suggests the benefit and importance of coordinated investment strategies for ensuring a solid, sustainable funding base for local Canadian open services and infrastructures.

While eight libraries have been paying article processing charges (APCs) for researchers to publish in open access journals, most (20) do not. The total spending by those eight libraries is \$1.16 million. However, this undoubtedly represents only a small portion of the total amount being paid by Canadian researchers toward APCs. Given the average APC is estimated to be approximately \$2,870 CAD⁹ and there are estimated to be several thousand articles published by Canadian authors in journals that charge APCs each year, we can assume that a significant amount of funds are going toward APCs. and that many researchers are using other sources outside of the library to pay, such as grants or departmental funds. Better national tracking of these funds is needed to ensure we have a good grasp of the total amounts of funds in the system to make informed decisions about funding. To address the lack of knowledge about APCs in Canada, CARL, the Canadian Research Knowledge Network (CRKN), and Canada's federal granting agencies have started working together to collect more comprehensive information about the current resources going toward APCs in Canada.

⁹ According to the OpenAPC initiative, the mean for individual APCs paid (averaged across all institutions for which it had data in 2019) is 1,890 € - approximately \$2,870 CAD. <https://treemaps.intact-project.org/apcdata/openapc/#institution/period=2019>

The benefits of collective approaches, as opposed to piecemeal or individual investments, is clearly evident from the survey results. Coordination at the national or regional level amplifies the impact of investments through greater alignment, reducing redundancies, and creating sustainable funding for priority services or infrastructures. The Portage initiative, a national research data management network that was launched by CARL in 2015, is a good example of how a collective approach can strengthen institutional investments. Although the funding for Portage and for research data management at each institution was lower than funding for other services (such as institutional repositories and local open access journals), Portage has been highly successful in delivering national RDM services, and is now receiving significant funds through Canada's New Digital Research Infrastructure Organization (NDRIO). Similarly, shared national funding approaches to Canadiana and Coalition Publica through CRKN has provided greater sustainability for those initiatives and offers some operational certainty for these platforms.

International initiatives receiving support from Canadian institutions as well as other institutions around the world (for example DOAJ, Open Library of Humanities, or PKP) have demonstrated the viability of non-APC collective funding for open projects. Canada has made important contributions to this landscape, including through participation in The Global Sustainability Coalition for Open Science Services (SCOSS), which has led to increased Canadian investments in SCOSS-endorsed open infrastructures.

Conclusion

The Canadian Association of Research Libraries' vision is of an open, sustainable, and innovative scholarly communication system that is governed and managed by the scholarly community; a system in which libraries and other stakeholders (e.g. researchers, funders, universities) collectively manage and fund the "scholarly commons" (or knowledge commons). However, in order to do this, we need to create the systems and frameworks that allow us to adopt more coherent and comprehensive support for the services and infrastructures of which this commons is composed. Like many other public goods, such as clean air and parks, scholarship increases in value the more it is shared. But also like other public goods, we need to find ways to fund the scholarly commons and to develop robust models that become the accepted norms.

Adopting community-based targets or baseline expectations related to Canadian research library investments in open could help academic libraries rationalize their spending in these areas. Although the 2.5% discussion about common open infrastructure funding was, to some degree, the impetus for this survey, the scope of this survey was much broader and included local services, as well as shared regional

and national investments. Therefore, a direct juxtaposition of figures is not appropriate. However, it is clear that we can accelerate progress toward openness by developing appropriate targets that increase investments in open over time.

Moreover, it is evident that investments will be more effective if they are done in a coordinated fashion. The value of collective action to fund shared infrastructure and open services has already been demonstrated in Canada through projects like Portage, Canadiana and Coalition Publica. Shared investment opportunities have a positive collective impact for researchers and organizations that far outweigh individual financial contributions. Because Canada has a relatively small number of universities, with well-established regional and national library associations who have a history of supporting collaboration and shared investments (CARL, Canadian Research Knowledge Network, Council of Atlantic University Libraries, Ontario Council of University Libraries and Council of Prairies and Pacific University Libraries), we are well placed to develop and execute a more strategic and impactful approach to investments in open.

The sharing and repurposing of research outputs is a key advantage of digital scholarship, the potentialities of which are only just beginning to be leveraged. The evolution and impact of digital scholarship on research, culture, politics, the economy, and society will only be fully realized in the coming decades. The current efforts documented in this survey demonstrate how Canadian academic libraries have been reorienting budgets toward support for open scholarship. These efforts will continue to expand over time, as open access to resources becomes a greater strategic priority for libraries, but also for the research and higher education sectors, as well as the public at large.

The open scholarly commons is a complex mix of local, regional, national, and international content, infrastructures, and services. As a next step, through the development of a more coherent national framework, we can consider as a community what are our priorities and targets; what are the most effective approaches to supporting open initiatives at these different levels; and how to ensure interoperability and alignment across infrastructures and services. These efforts will greatly accelerate Canada's progress toward open scholarship and help to inform similar work being undertaken in other countries and regions.